

WHAT IS CLAIMED IS:

1. A monolithic MEMS spectrophotometer comprising
a monolithic substrate;
an optical fiber mounted on said monolithic substrate to input a light beam;
a grating movable to a position to diffract said light beam from said optical fiber, said grating defined in said monolithic substrate; and
a photodetector in said monolithic substrate to receive said diffracted light beam from said grating; said optical fiber, said grating and said photodetector being on a Rowland circle.
2. The monolithic MEMS spectrophotometer of claim 1 wherein the grating is defined in a movable support structure on the monolithic substrate to extend at an angle to a substrate surface of said monolithic substrate.
3. The monolithic MEMS spectrophotometer of claim 1 further comprising a V-groove defined in said monolithic substrate to hold said optical fiber.
4. The monolithic MEMS spectrophotometer of claim 1 wherein said photodetector has a p-i-n structure
5. The monolithic MEMS spectrophotometer of claim 1 wherein said grating is a reflective cylindrical grating.
6. The monolithic MEMS spectrophotometer of claim 5 wherein said reflective cylindrical grating has a bimorph material layer, said bimorph material layer causing said reflective cylindrical grating to form a cylindrical shape.

7. The monolithic MEMS spectrophotometer of claim 1 further comprising a driver on said monolithic substrate to move said grating.
8. The monolithic MEMS spectrophotometer of claim 7 wherein said driver is a microelectromechanical comb drive.
9. The monolithic MEMS spectrophotometer of claim 8 wherein said microelectromechanical comb drive has a fixed comb set attached to said monolithic substrate and a moveable comb set attached to said grating.
10. The monolithic MEMS spectrophotometer of claim 1 further comprising signal processing circuitry connected to said photodiode and to said grating.
11. The monolithic MEMS spectrophotometer of claim 8 further comprising signal processing circuitry connected to said photodiode and to said microelectromechanical comb drive for said grating.
12. A monolithic MEMS spectrophotometer comprising
a monolithic substrate;
an optical fiber mounted on said monolithic substrate to input a light beam;
a grating movable to a position to diffract said light beam from said optical fiber, said grating defined in said monolithic substrate;
a photodetector in said monolithic substrate to receive said diffracted light beam from said grating; said optical fiber, said grating and said photodetector being on a Rowland circle; and

a microelectromechanical comb driver on said monolithic substrate to move said grating, and

13. The monolithic MEMS spectrophotometer of claim 12 further comprising signal processing circuitry connected to said photodiode and to said microelectromechanical comb drive for said grating.

14. The monolithic MEMS spectrophotometer of claim 12 wherein said grating is a reflective cylindrical grating.

15. The monolithic MEMS spectrophotometer of claim 14 further comprising signal processing circuitry connected to said photodiode and to said microelectromechanical comb drive for said grating.

16. The monolithic MEMS spectrophotometer of claim 12 wherein said monolithic MEMS spectrophotometer is a color sensor.